References

1. Michel-Behnke I, Akintuerk H, Valeske K, Thul J, Mueller M, Schranz D. Pseudoaneurysm of the pulmonary trunk after placement of an adjustable pulmonary artery banding device (FloWatch-PAB) in a patient with muscular ventricular septal defect. *J Thorac Cardiovasc Surg*. 2005;130:894-5.
2. Cordell AR. Complications of pulmonary artery debanding.In: Cordell AR, Ellison RG, editors. Complications of intrathoracic surgery. Boston: Little, Brown and Company; 1979. p. 162-6.
3. Corno AF, Sekarski N, Bernath MA, Payot M, Tozzi P, von Segesser LK. Pulmonary artery banding: long-term telemetric adjustment. *Eur J Cardiothorac Surg*. 2003;23: 317-22.
4. Corno AF, Bonnet D, Sekarski N, Sidi D, Vouhé P, von Segesser LK. Remote control of pulmonary blood flow: initial clinical experience. *J Thorac Cardiovasc Surg*. 2003;126: 1775-80.
5. Corno AF, Prosi M, Fridez P, Zunino P, Quarteroni A, von Segesser LK. No more pulmonary artery reconstruction after banding. Computational fluid dynamics and clinical evidence. *Eur J Cardiothorac Surg*. 2006; 29:93-6.

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Reply to the Editor:

We appreciate the thoughtful comments of Corno and associates[1] about our recent study. The exciting results pointing out the advantages of the FloWatch-PAB[2,3] forced us to use this device in the case presented. Because of the localization of the ventricular septal defect in the muscular septum, increased pulmonary artery pressure and the patient's young age made us optimistic that the adjustable FloWatch banding device would be the ideal solution for this patient. For this reason, we avoided a conventional banding as suspected by the authors, and even looking thoroughly at all available intraoperative images, we are not able to visualize surgical damaging of the pulmonary artery trunk before placement of the device. After removal, the device was carefully studied for any sharp edges that might have occurred during the manufacturing process and could have been responsible for the observed pseudoaneurysm formation, which could be ruled out.

However, the early detection of pericardial effusion and the loss of the banding effect suggest some damage to the integrity of the vessel wall while the aneurysm was detected on radiography only 7 weeks later. Therefore we are confident that the patient had a real complication rather than a coincidence. We agree that the physical properties of the FloWatch-PAB, especially the maintenance of the circumferential length of the pulmonary artery, should be helpful to prevent the complications of conventional banding procedures. Our personal experience in 2 other patients with multiple ventricular septal defects, in whom we removed the device 16 and 27 months after placement, respectively, support the usefulness of this new medical implant. Nevertheless, facing even rare complications, as we described, should contribute to increase patient safety.

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References

1. Michel-Behnke I, Akintuerk H, Valeske K, Thul J, Mueller M, Schranz D. Pseudoaneurysm of the pulmonary trunk after placement of an adjustable pulmonary artery banding device (FloWatch-PAB) in a patient with muscular ventricular septal defect. *J Thorac Cardiovasc Surg*. 2005;130:894-5.
2. Corno AF, Bonnet D, Sekarski N, Sidi D, Vouhe P, Von Segesser LK. Remote control of pulmonary blood flow: initial clinical experience. *J Thorac Cardiovasc Surg*. 2003; 126:1775-80.
3. Corno AF, Sekarski N, Bernath MA, Payot M, Tozzi P, Von Segesser LK. Pulmonary artery banding: long-term telemetric adjustment. *Eur J Cardiothorac Surg*. 2003;23: 317-22.

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Evaluation of a modified ThermoWrap™ for the Allon™ warming system in patients undergoing elective off-pump coronary artery bypass grafting

To the Editor:

We have previously shown in this journal[1] that the Allon™ patient-warming system (Allon™ 2001 system; MTRE Advanced Technologies Ltd, Or-Akiva Industrial Park, Israel) is efficient in maintaining normothermia during off-pump coronary artery bypass grafting (OPCABG), resulting in reduced perioperative blood loss and transfusion requirements. However, the ThermoWrap™ used with this system is expensive, complications (ie, burns) have been described,[2] and handling can be time consuming. Meanwhile, we evaluated the new version of a ThermoWrap™ for the Allon™ system in terms of handling and efficacy. In contrast to the old version of the ThermoWrap™, the design of the new wrap has been modified to improve patient care and to reduce potential skin damage, as well as costs. With institutional approval and informed consent, 40 consecutive patients (mean age ± standard deviation [SD], 68 ± 10 years; mean body mass index ± SD, 28 ± 5 kg · m^{-2}; mean Euroscore ± SD, 6 ± 3) undergoing elective OPCABG were randomly assigned to either the original (group A, n = 20) or the modified (group B, n = 20) ThermoWrap™. According to our previous temperature measurement study,[1] active warming was started after induction of anesthesia, with the Allon™ system set to 36.9°C body core temperature (BCT). BCT was recorded every 30 minutes during surgical intervention, and maximal intraoperative BCT decrease, as well as increase, was calculated. Skin alterations (reddening) were assessed by using a visual analog scale (score, 1-10) at the end of the procedure. During the clinical evaluation, 15 involved staff members completed a questionnaire on handling of the Allon™ system. The answers were recorded by using a Likert scale (score, 1-4). The Student *t* test was used for statistical analyses. Durations of OPCABG procedures were comparable (group A, 257 ± 59 minutes; group B, 269 ± 53 minutes; $P = .89$). There was no significant difference of BCT at the beginning and end of the intervention (Figure 1). Intraoperative BCT changes were significantly different for group A compared with group B (BCT decrease/increase: group A, −0.7°C ± 0.4°C/+1.2°C ± 0.3°C; group B, −0.4°C ± 0.3°C/+1.0°C ± 0.3°C; $P < .05$). Skin alterations were comparable for both groups (visual analog scale: group A, 6 ± 1; group B, 6 ± 1; $P = .78$). According to 80% of the interviewed staff members, positioning of the modified wrap B was superior and less time consuming compared with wrap A. On the basis of these results, patient management can be further improved by using the Allon™ system with the new modified ThermoWrap™.

This study was performed without any financial support from manufacturers or the pharmaceutical industries. The Allon™

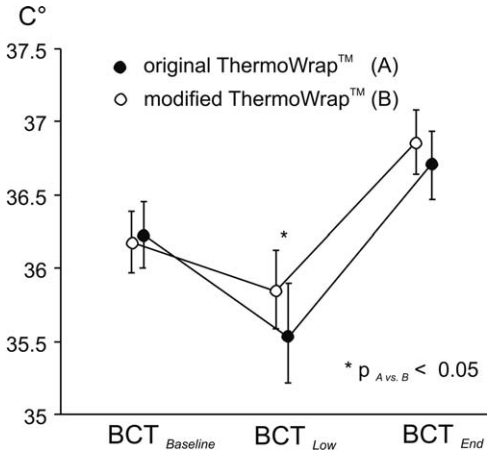

Figure 1. Intraoperative course of body core temperature using the old and modified ThermoWraps for the Allon™ 2001 system. $BCT_{Baseline}$: Body core temperature after induction of anesthesia before surgical intervention; BCT_{Low}: lowest intraoperative body core temperature; BCT_{End}: body core temperature at the end of surgical intervention.

2001 system is used on a regular basis for all patients undergoing OPCABG at the Triemli City Hospital. The modified ThermoWraps were provided free of charge by MTRE Advanced Technologies Ltd, Israel. None of the authors is related to or has financial interests in the manufacturers of the products studied. Also, there are no consultancy agreements between any authors and the manufacturer. Moreover, no specific institutional funding was necessary because all authors are regularly employed at the institutions mentioned above.

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References

1. Hofer CK, Worn M, Tavakoli R, Sander L, Maloigne M, Klaghofer R, et al. Influence of body core temperature on blood loss and transfusion requirements during off-pump coronary artery bypass grafting: a comparison of 3 warming systems. *J Thorac Cardiovasc Surg*. 2005;129:838-43.
2. Gali B, Findlay JY, Plevak DJ. Skin injury with the use of a water warming device. *Anesthesiology*. 2003;98:1509-10.

doi:10.1016/j.jtcvs.2005.11.034

Unexpected pulmonary embolism in lung transplantation: Diagnosis and prospects

To the Editor:

I read with interest the article by Oto and colleagues, wherein they study and reflect upon the role of unexpected pulmonary embolism in lung transplantation.[1] The authors have employed exploratory flush as a diagnostic tool for identification of emboli and quote it as the only diagnostic tool capable for identification of emboli in the subsegmental pulmonary vasculature.[1] The procedure is invasive and can only be undertaken after the lungs have been procured from a donor. In other words, there has already been a certain consumption of time and resources before exploratory flush is carried out to indicate whether the donor lungs are suitable for the recipient. In contrast, multirow helical computed tomography is now widely accepted as a safe, noninvasive, and accurate tool for identification of emboli to the subsegmental pulmonary vasculature.[2] The procedure can identify donors before they are selected for prospective donation of their lungs and thus save considerable amount of time and resources. This is of particular relevance, considering that exploratory flush showed no therapeutic benefit and was only indicated as a diagnostic tool.[1]

The authors propose that donors with risk factors for unexpected pulmonary embolism should be demarcated as marginal donors.[1] However, trials have established that liberalization of donor criteria (with incorporation of donors having risk factors including those mentioned in this report) has no adverse outcomes of significance and leads merely to expansion of the donor pool and overcoming of shortage of donor lungs.[3-5]

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References

1. Oto T, Rabinov M, Griffiths AP, Whitford H, Levvey BJ, Esmore DS, et al. Unexpected donor pulmonary embolism affects early outcomes after lung transplantation: a major mechanism of primary graft failure? *J Thorac Cardiovasc Surg*. 2005;130:1446.
2. Patel S, Kazerooni EA. Helical CT for the evaluation of acute pulmonary embolism. *AJR Am J Roentgenol*. 2005; 85:135-49.
3. Bhorade SM, Vigneswaran W, McCabe MA, Garrity ER. Liberalization of donor criteria may expand the donor pool without adverse consequence in lung transplantation. *J Heart Lung Transplant*. 2000;19:1199-204.
4. Lardinois D, Banysch M, Korom S, Hillinger S, Rousson V, Boehler A, et al. Extended donor lungs: eleven years experience in a consecutive series. *Eur J Cardiothorac Surg*. 2005;27:762-7.
5. Sundaresan S, Semenkovich J, Ochoa L, Richardson G, Trulock EP, Cooper JD, et al. Successful outcome of lung transplantation is not compromised by the use of marginal donor lungs. *J Thorac Cardiovasc Surg*. 1995; 109:1075-9; discussion 1079-80.

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Reply to the Editor:

Thank you for the invitation to respond to Dr Ashraf's letter to the editor. The aims of our study were to describe the incidence of